

West Nile Virus Update in Elephants January 2004

To veterinarians, elephant managers, and other interested parties:

As the Elephant TAG/SSP Veterinary Advisor, I have received a number of inquiries about West Nile Virus infection in captive elephants due to concerns about potential cases during fall 2003 at the Kansas City Zoo. After extensive discussions with Dr. Kirk Suedmeyer and based on the array of diagnostic testing that was performed, it does not appear that either bull (Casey or Dale) died as a result of infection with West Nile Virus. Although elephants may become infected with this virus, at this time, we still have not had a confirmed clinical case of **disease** caused by WNV in an elephant in the North American population that has been reported to the TAG/SSP.

It is important to take this opportunity to explain our current understanding of antibody titers to WNV, particularly in elephants, since this is a frequently asked question. There is anecdotal evidence that elephants (both species) can become infected/exposed and develop antibody titers that can be detected in screening tests (serum neutralization). However, antibodies to other encephalitis viruses (ex. St. Louis encephalitis virus) can cross-react in some screening tests and lead to a positive result. A second type of test, virus neutralization, is required to distinguish whether the elephant truly has antibodies to WNV or a similar virus. Cornell University currently is performing these analyses through a grant supported by the CDC to examine the presence of WNV in zoo collections. By submitting samples to Cornell, the results are added to a confidential database that will provide information on zoo populations (all results are coded) that can help us answer the question of WNV exposure in captive elephant populations and use a standardized laboratory to compare results.

A positive titer in the screening test (SN) at 1:40 is suggestive of exposure/infection or vaccination to WNV or a cross-reactive virus, but cannot distinguish between these. A follow-up test (virus neutralization) should be requested on the same sample to get a titer "endpoint". The higher the dilution, the higher the amount of antibody. This *may* correlate with degree of exposure or level of immunity in vaccinated animals, but we don't have enough information about elephants at this time to make these interpretations. High titers in clinically normal elephants should not necessarily be a concern, but might be a cause for a veterinarian to examine the source of exposure in an unvaccinated animal.

At this time, a number of institutions have reported individual elephants with titers as high as 1:4000 or greater without any clinical signs. Again, **any interpretation of titer results should be assessed in conjunction with the clinical assessment and other diagnostic findings**. Positive titers should be followed at 2-4 week intervals, when possible, to determine if they are increasing (usually indicates that the timing of the initial titer was taken around the time of exposure) or decreasing (exposure was prior to sample, sometimes but considerable time period).

Since documented clinical disease has not been confirmed, recommendation for WNV vaccination in elephants is unchanged. Institutions that have experienced WNV cases in other species or their region might consider vaccinating their elephants. Those institutions that have used the commercial equine WNV vaccine have not reported adverse effects. The commercial vaccine contains killed virus and does not present a risk of causing infection. Early concerns regarding abortions in vaccinated horses have been unsubstantiated. The benefit of the vaccine in elephants is unknown at this time. If planning to vaccinate your elephant(s), a pre-vaccination serum sample should be obtained and WNV titer performed (or serum banked) to allow future analyses of post-vaccination serum antibody development in that animal. Follow current

recommendations for vaccinating horses with WNV in your region (for example, areas with year-round mosquito populations may require 3 vaccinations per year for adequate protection). Serum samples should be collected at the time of each booster, and opportunistically for measurement of antibody titers.

Please feel free to direct any questions or comments to Michele Miller at Disney's Animal Kingdom, email: Michele.Miller@disney.com; phone: (407) 939-7316.

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June 2004

WNV update - there have been additional reports of high WNV titers in elephants without evidence of clinical signs. If you have performed WNV serology on your elephants, could you please send any information with titers and dates that could be tabulated and shared? If you don't wish for your institution or animal to be identified, that can be kept confidential but it would be helpful to others to see how many elephants have seroconverted as many institutions are still struggling with the issue of vaccination. Michele.Miller@disney.com; phone: (407) 939-7316